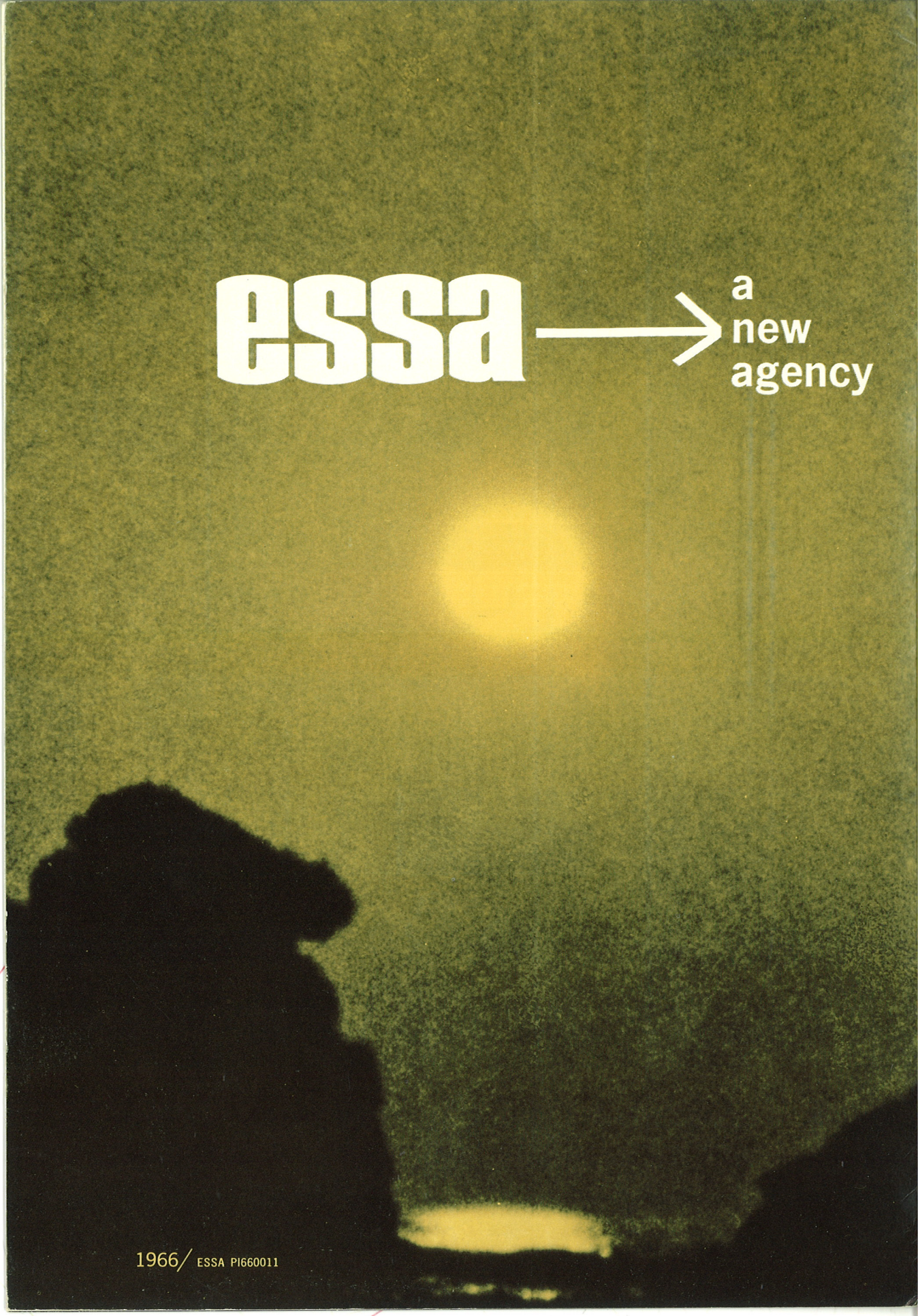
essa

—a new agency in which environmental science service and research are applied to improving man's prospects for survival, as they are influenced by the physical environment.

U.S. DEPARTMENT OF COMMERCE
Environmental Science Services Administration

essa → a new agency



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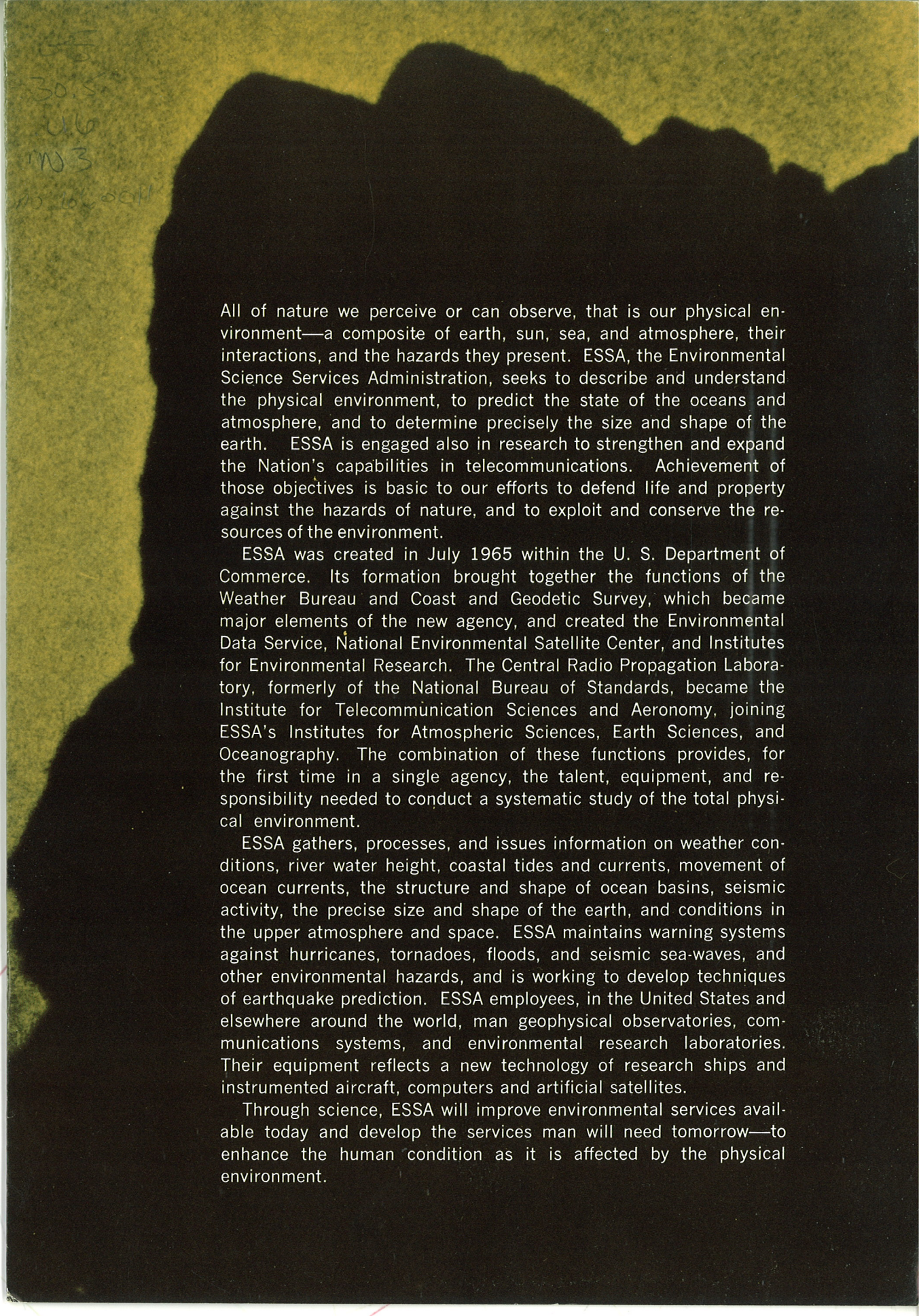


All of nature we perceive or can observe, that is our physical environment—a composite of earth, sun, sea, and atmosphere, their interactions, and the hazards they present. ESSA, the Environmental Science Services Administration, seeks to describe and understand the physical environment, to predict the state of the oceans and atmosphere, and to determine precisely the size and shape of the earth. ESSA is engaged also in research to strengthen and expand the Nation's capabilities in telecommunications. Achievement of those objectives is basic to our efforts to defend life and property against the hazards of nature, and to exploit and conserve the resources of the environment.

ESSA was created in July 1965 within the U. S. Department of Commerce. Its formation brought together the functions of the Weather Bureau and Coast and Geodetic Survey, which became major elements of the new agency, and created the Environmental Data Service, National Environmental Satellite Center, and Institutes for Environmental Research. The Central Radio Propagation Laboratory, formerly of the National Bureau of Standards, became the Institute for Telecommunication Sciences and Aeronomy, joining ESSA's Institutes for Atmospheric Sciences, Earth Sciences, and Oceanography. The combination of these functions provides, for the first time in a single agency, the talent, equipment, and responsibility needed to conduct a systematic study of the total physical environment.

ESSA gathers, processes, and issues information on weather conditions, river water height, coastal tides and currents, movement of ocean currents, the structure and shape of ocean basins, seismic activity, the precise size and shape of the earth, and conditions in the upper atmosphere and space. ESSA maintains warning systems against hurricanes, tornadoes, floods, and seismic sea-waves, and other environmental hazards, and is working to develop techniques of earthquake prediction. ESSA employees, in the United States and elsewhere around the world, man geophysical observatories, communications systems, and environmental research laboratories. Their equipment reflects a new technology of research ships and instrumented aircraft, computers and artificial satellites.

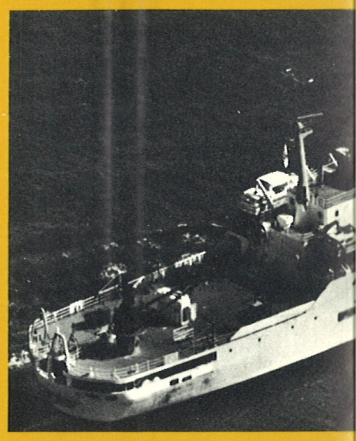
Through science, ESSA will improve environmental services available today and develop the services man will need tomorrow—to enhance the human condition as it is affected by the physical environment.

Environmental Science Services

ESSA's services, and the applied research pertaining to those services, are centered in four operational elements: The Weather Bureau, Coast and Geodetic Survey, Environmental Data Service, and National Environmental Satellite Center.

THE WEATHER BUREAU reports the weather of the United States and its possessions, provides weather forecasts to the general public, issues warnings against tornadoes, hurricanes, floods, and other weather hazards, and records the climate of the United States. In addition to this basic weather service, the Weather Bureau develops and furnishes specialized weather services which support the needs of agricultural, aeronautical, maritime, space, and military operations. The services of the Weather Bureau are supported by a national network of surface and upper-air observing stations, aircraft, satellite systems, communications, and computers. Some 300 Weather Bureau offices in cities across the land maintain close contact with the general public, to ensure prompt and useful dissemination of weather information.

THE COAST AND GEODETIC SURVEY prepares nautical and aeronautical charts that promote the safety and efficiency of marine and air navigation, and conducts surveys to develop and maintain the precise geodetic control network essential to mapping and engineering projects. The Survey's programs in geophysics include measurement of gravity and determinations of the earth's size and shape. Geophysical observatories, mobile field parties, and a worldwide network of seismograph stations provide the data used by the Survey in monitoring earthquake activity and variations in the earth's magnetic field—and in issuing seismic sea-wave warnings to Pacific nations. The Survey is also active in photogrammetry and satellite geodesy. Oceanic operations include hydrographic surveys, marine gravity and magnetic surveys, and measurement of tides and currents; a 14-ship fleet conducts hydrographic surveys, and supports the programs of ESSA's Institute for Oceanography.



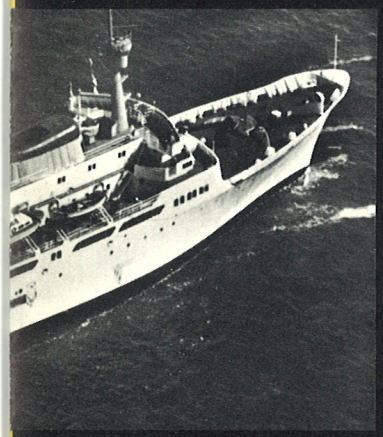
THE ENVIRONMENTAL DATA SERVICE collects, processes, archives, publishes, and issues environmental data gathered on a global scale. The Service maintains data centers for geodetic, geomagnetic, seismological, climatological, and other geophysical information, providing a single source of readily available environmental data to specialized and general user groups. To provide effective data support, the Service is active in development of advanced data storage and retrieval methods and computer applications.

THE NATIONAL ENVIRONMENTAL SATELLITE CENTER plans and operates environmental satellite systems, gathers and analyzes satellite data, and develops new methods of using satellites to obtain environmental data. At present, the Center operates the TIROS Operational Satellite (TOS) weather system, which employs ESSA (Environmental Survey SAtellite) vehicles to monitor global cloud cover. As the ESSA series matures, sensors will be added to measure additional atmospheric characteristics, and to provide data on solar, ionospheric, oceanographic, and other geophysical phenomena.

Environmental Sciences Research

The Institutes for Environmental Research conduct and sponsor the fundamental investigations needed to develop the new and useful knowledge man requires in order to cope with his physical environment. These programs of national and international scope are carried out within the Institutes, and as sponsored research in educational and research institutions and private industry.

THE INSTITUTE FOR ATMOSPHERIC SCIENCES is concerned with developing a better understanding of the complex factors in the atmosphere that bring about not only our day-to-day weather, but the destructive and dramatic phenomena of drought, air pollution, hurricanes, and tornadoes. The theoretical observational studies of the Institute range from small-scale laboratory experiments to regional and worldwide studies based on international data exchanges and observations from satellites. Research centers such as the National Severe Storms Laboratory, the National Hurricane Research Laboratory, and the Geophysical Fluid Dynamics Laboratory, combined with facilities like the Research Flight Facility, contribute to the Nation's ability to understand, predict, and, ultimately, to develop methods of controlling weather phenomena, both on a small and large scale.



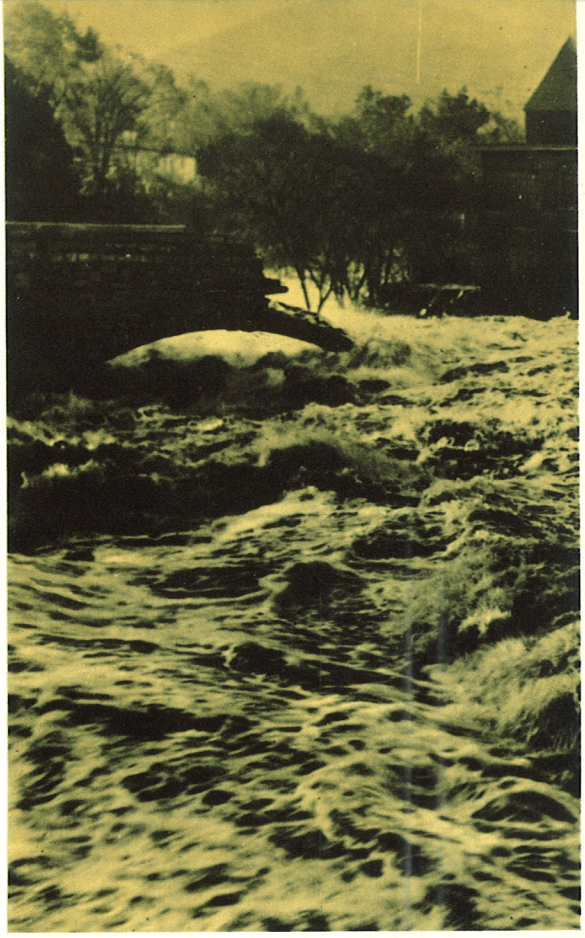
THE INSTITUTE FOR OCEANOGRAPHY conducts a comprehensive program of research on the physical characteristics of the global ocean, the sea floor, and of interaction among sea, land, and atmosphere. These investigations are carried out aboard research vessels of the Coast and Geodetic Survey, aboard research aircraft, in laboratories, and as cooperative programs with research groups at joint facilities. The field programs are conducted in the deep sea, in estuaries, along the coast, and in the Great Lakes. Institute projects include the National Ocean Survey (SEAMAP) Program, the seaward extensions of the Upper Mantle Project Transcontinental Survey, and other broadly based oceanographic investigations.

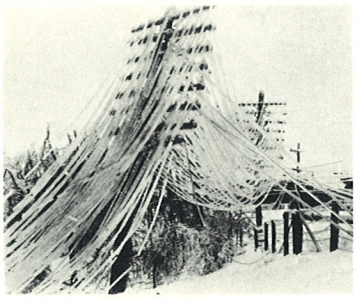
THE INSTITUTE FOR EARTH SCIENCES has as its basic mission the improvement of man's understanding of terrestrial phenomena related to the scientific disciplines of geomagnetism, seismology, geodesy, and other earth sciences. One of the intriguing research problems for the Institute is that of developing a sufficiently comprehensive understanding of earthquake mechanisms to permit the development of practical, sufficiently accurate earthquake-prediction techniques. Through the use of modern measurement techniques, including observations from satellites, the Institute is pushing toward solutions of other fundamental problems such as the source and time-space distribution of the earth's magnetic field, the precise geodetic definition of the size and shape of the earth and the location of significant features on it, as well as the size and shape of the moon and other bodies in the solar system.

THE INSTITUTE FOR TELECOMMUNICATION SCIENCES AND AERONOMY is actively engaged in research to strengthen and expand the Nation's capabilities in telecommunications, and it provides significant services related to radio, infrared, and optical phenomena. ITSA also is responsible for monitoring ionospheric conditions and forecasting those which are potentially disruptive to normal radio communications. In this and in other ways, the Institute contributes to this Nation's ability to utilize effectively the properties of the ionosphere and to understand solar effects and radiation hazards in the near-space environment. Although laboratory and field facilities are centered in Boulder, Colorado, stations located in other parts of the world and the use of satellites in the basic research program are significant elements in ITSA's contribution to coordinated activities in the environmental sciences.

Environmental Hazards Warning Systems

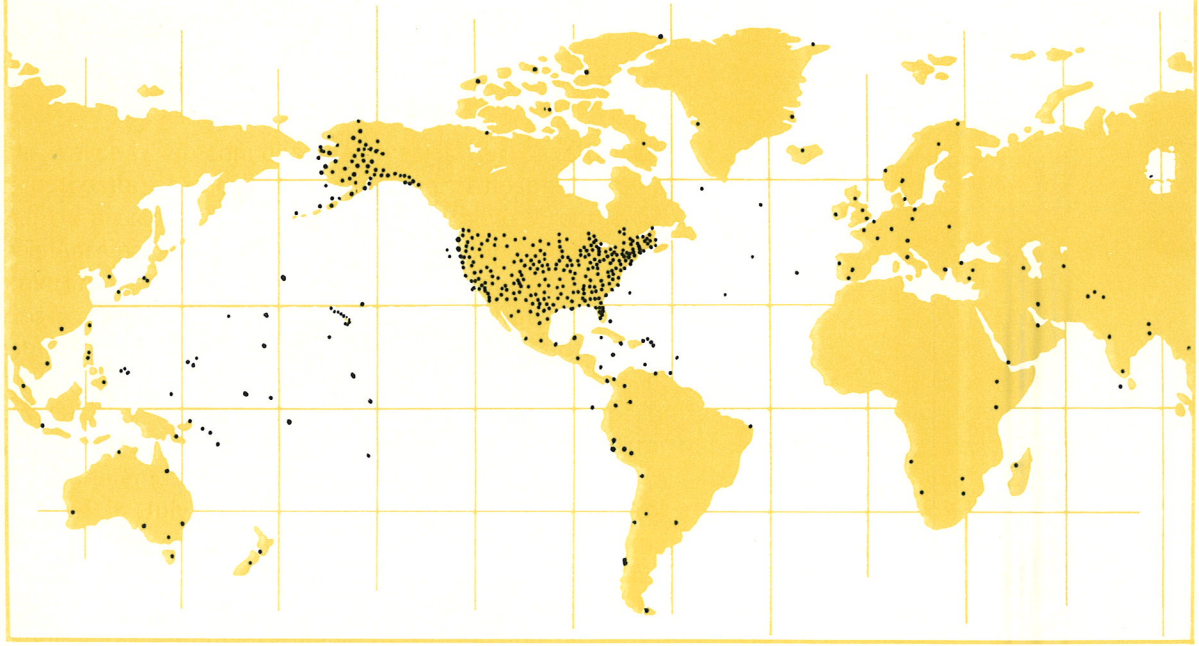
ESSA is taking major steps toward improving its environmental hazards warning systems, to reduce the toll of life and property exacted by natural catastrophe. The present tornado, hurricane, flood, severe storm, and seismic sea-wave warnings systems are continually improved, to speed detection of potentially destructive events. Research in ESSA attempts to develop ways of recognizing these events before they become destructive—and ways of modifying or controlling them. Earthquakes, which at present must occur to be detected, are under study to determine whether they have recognizable precursors, and whether their destructive effects can be accurately forecast.





The Shape of essa

Geographical



ESSA's personnel and facilities are distributed world-wide, and its participation in environmental science service and research programs is international in scope. Much of the agency's work is carried out by mobile field parties, and from ships and aircraft. The map shown here is an attempt to blend permanent and transient, national and intergovernmental, aspects of ESSA's operations. It is an estimate of the functional shape of ESSA, on a global scale, at a given time. This widely dispersed and varied range of activities is guided and conducted by the organization described below.

Organizational